

NEW OR LITTLE-KNOWN CRANEFLIES FROM THE UNITED STATES AND CANADA. TIPULIDÆ, DIPTERA.

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During the past few years the various collections of craneflies in the Eastern United States have been examined by the author and observations made upon the more uncommon and less-known species. The following paper deals with the new species discovered, the corrections in synonymy and the geographical distribution of insufficiently known forms. The collections examined are those of the United States National Museum through the kindness of Mr. Knab, The Academy of Natural Sciences of Philadelphia through Mr. Cresson, the Museum of Comparative Zoology at Cambridge through Mr. Henshaw, the Boston Society of Natural History through Mr. Johnson and the private collections of Dr. W. G. Dietz, Mr. C. W. Johnson, and Mr. M. C. Van Duzee.

The Loew and Osten Sacken types are in the Museum of Comparative Zoology (excepting *Triogma exculpta* Osten Sacken, which is in The Academy of Natural Sciences of Philadelphia). Coquillett's types and the Limnobiinæ described by Doane in his first paper are in the National Museum. The species described by Mr. Johnson are in The Academy of Natural Sciences of Philadelphia, the Boston Society of Natural History or in the private collection of the describer.

Family TIPULIDÆ.

Subfamily LIMNOBINÆ.

Tribe Limnobiini.

Genus DICRANOMYIA Stephens.

1829. *Dicranomyia* Stephens; Cat. Brit. Ins., vol. 2, p. 243.*Dicranomyia nelliana* sp. n.

Color gray; wings with vein *Sc* short; membrane hyaline with abundant brown spots and dots.

Male, length, 5.5 mm.; wing, 7.5 mm.

Rostrum, palpi and antennæ dark brown, the segments of the antennal flagellum rounded oval. Head gray.

Thoracic dorsum gray, the præscutum with a large dark brown spot in front whose exact limits behind are uncertain, due to the

injury done to the thorax by the pin; scutum gray medially, the lobes yellow outwardly, black on the inner part of the lobe; scutellum gray medially, black on the sides; postnotum blackish gray. Pleuræ gray. Halteres yellow, the knob darker. Legs, coxæ and trochanters dull yellow, femora yellowish brown, the tip broadly dark brown, tibiæ light brown, the tip narrowly dark brown, tarsal segments 1 and 2 light brown, the tips of the segments brown, segments 3 to 5 brown. Wings hyaline with abundant brown markings in all the cells including a series of four large marks along the costa, the third at the origin of *Rs* and the fourth at the stigma; venation (Pl. XXVII, fig. 22): *Sc* short ending opposite the origin of *Rs*, basal deflection of *Cu*₁ before the fork of *M*.

Abdomen with the basal tergites dull brownish yellow, dark brown laterally, segments 6 to 8 dark brown, the hypopygium yellow; sternites dull light yellow, the lateral margin of the sclerites brown, segments 6 to 8 uniformly darker.

Holotype, ♂, Colorado, in the U. S. National Museum.

This is the only North American species with the short subcosta that has the wings so spotted; superficially this insect resembles *simulans* Walker which has a long subcosta, but in the details it is quite a different fly.

Dieranomyia reticulata Alexander.

1912. *Furcomyia reticulata* Alexander; Canadian Entomologist, vol. 44, pp. 334, 335, pl. 11, fig. p.

One female from Biscayne Bay, Dade Co., Fla., taken by Mrs. Slosson, constitutes the first record for the United States.

Genus **RHIPIDIA** Meigen.

1818. *Rhipidia* Meigen; Syst. Besch., vol. 1, p. 153.

Rhipidia (Rhipidia) bryanti Johnson.

1909. *Rhipidia bryanti* Johnson; Proceedings of the Boston Society of Natural History, vol. 34, pp. 123, 124, pl. 16, fig. 20.

This showy *Rhipidia* has been bred from decaying wood underneath bark by Mr. R. C. Shannon at Washington, D. C. The male has never been described, but has been found several times; the antennæ in this sex are bipectinate. The collections of Dr. Dietz, Mr. VanDuzee and the National Museum indicate a wide range for this species. Orono, Penobscot Co., Me., June 30, 1913 (Alexander). East Aurora, Erie Co., N. Y., June 15, 1912 (VanDuzee). Plummers Island, Md., September 4, 1904. Potomac Park, Washington, D. C., May 11, 1913 (Shannon). Black Mts., Buncombe Co., N. Car., June 16, 1912 (Beutenmuller). Braidentown, Manatee Co., Fla.,

March (Van Duzee). Clear Creek, Clear Creek Co., Col., June 10, 1912 (Osler). Kirbyville, Jasper Co., Tex., March 21, 1908 (E. S. Tucker).

Rhipidia (Arhipidia) schwarzi Alexander.

1912. *Rhipidia schwarzi* Alexander; Bulletin of the Brooklyn Entomological Society, vol. 8, pp. 13, 14, pl. 1, fig. e.

One female from Biscayne Bay, Dade Co., Fla., taken by Mrs. Slosson. Three females from Braidentown, Manatee Co., Fla., taken in March, 1913, by Mr. M. C. Van Duzee.

Rhipidia (Arhipidia) shannoni sp. n.

Antennæ subpectinate, black; thoracic dorsum without a broad pale margin in front; postnotum velvety black; wings with a few dark brown spots and with abundant gray dots in all the cells.

Male, length, 4.9–5.1 mm.; wing, 6.7–6.8 mm.

Female, length, 5.4–5.6 mm.; wing, 5.8–7.2 mm.

Rostrum, palpi and antennæ black. Head gray.

Mesonotal præscutum yellowish brown without distinct markings except behind near the suture where there are two brown spots on either side of the median line, narrowly separated from one another, a more linear mark on either side; scutum very light yellow medially, darker on the lobes with a dark brown ring on each lobe; scutellum light yellow with a dusky mark on either side of the middle line; postnotum with a deep velvety black triangle with its point behind, the sclerite pale on the sides. Pleuræ brown with a gray bloom with two narrow brown stripes, the more dorsal less clean-cut, the ventral one narrow, well-defined, beginning on the fore coxa, traversing the bases of the other coxæ. Halteres brownish yellow. Legs, coxæ yellow, brown at the base on the outer face, trochanters dull yellow, femora yellowish brown, tibiæ and tarsi yellowish brown, the two apical segments of the latter black. Wings light yellow with a few large brown spots as follows: a large one beyond the middle of vein *Sc*, smaller ones above the areulus, origin of *Rs*, tip of *Sc*₁ and a large rounded spot at the stigma; paler seams along the cord and outer end of cell *1st M*₂, abundant pale gray dots in all the cells; venation (Pl. XXVII. fig. 23).

Abdomen grayish brown, the pleural line narrowly dark.

Holotype, ♂, Plummers Island, Md., June 14, 1913 (R. C. Shannon).

Allotype, ♀, topotypic, August 18, 1912 (J. R. Malloch).

Paratype, ♂, Cabin John, Md., August 30 (Fred'k Knab); ♀, Gatun, Canal Zone, Panama, December 12, 1912, at light (J. Zetek).

Related to *R. multiguttata* Alexander (Guatemala) and in my key to the species of this genus¹ it would run down to this form. It differs widely in its wing-pattern which resembles that of certain members of the *subpectinata* group (*annulicornis* Enderlein, *schwarzi* Alexander) in the prominent rounded dark spots at the base of the sector and at the stigma. The thoracic pattern, especially the velvety black postnotum, separates this species off from any of the described forms.

This species is named in honor of Mr. Raymond C. Shannon, assistant to Mr. Knab in the Department of Dipterology at Washington, who collected the type and who has reared many interesting craneflies.

Tribe **Antochini**.

Genus **TEUCHOLABIS** Osten Sacken.

1859. *Teucholabis* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 222.

Teucholabis rubescens sp. n.

Head and abdomen black; thorax red; wings dark colored; legs brownish black.

Male, length, 6.8-7 mm.; wing, 7.1-7.3 mm.

Rostrum short, dark brown; palpi dark brownish black. Antennæ dark brownish black, the flagellar segments rounded. Head black.

Pronotum dark brown. Mesothorax reddish orange. Halteres brown, the knobs darker. Legs, coxæ and trochanters dark brown, femora brownish yellow at base, darkening to the tip, tibiæ and tarsi dark brownish black. Wings with a decided brown tinge, stigma rather distinct, small; veins dark brown; venation (Pl. XXVII, fig. 24).

Abdomen dark brownish black.

Holotype, ♂, Rio Ruidoso, White Mts., N. Mex., alt. about 3,500 feet, July 25 (hovering around trunks of mountain cotton-wood) (C. H. T. Townsend).

Paratype, ♂, topotypic.

Related to *T. flavithorax* Wiedemann in the bright colored thorax and dark wings; it is a smaller species with the wings much lighter colored, the stigma smaller and more distinct, the femora with the bases brighter colored, not entirely jet-black. In *flavithorax* the legs are stout and covered with long, conspicuous hairs, while in *rubescens* the hairs are not conspicuous; the basal tarsal segments of *flavithorax* are light yellow, conspicuously lighter colored than the

¹ *Bulletin of the Brooklyn Entomological Society*, vol. 8, pp. 7, 8; 1912.

tibiæ, but in *rubescens* the tarsi are dark brown, concolorous with the tibiæ.

Tribe **Eriopterini.**

Genus **ERIOPTERA** Meigen.

1803. *Erioptera* Meigen; Illiger's Magaz., vol. 2, p. 262.

Subgenus **MESOCYPHONA** Osten Sacken.

1869. *Mesocyphona* Osten Sacken; Mon. Dipt. N. Am., vol. 4, p. 152.

Erioptera (Mesocyphona) rubia sp. n.

Dark brownish black; wings dark brown with white spots and a white cross-band at the cord.

Female, length, 4 mm.; wing, 4.2 mm.

Rostrum, palpi and antennæ black, flagellar segments rounded oval. Head black.

Thoracic dorsum dark brownish black with a sparse brown bloom, the area darker in front of the pseudosutural foveæ. Pleuræ dark brown with a sparse gray bloom. Halteres yellow, the knobs a little darker. Legs, coxæ and trochanters very dark brown, femora dark brownish black, greatly enlarged at the tip, tibiæ dark brown, the tip darker, tarsi with the basal half of the metatarsi dull brownish yellow, remainder of the feet dark brown. Wings dark brown with white marks as follows: a large rounded spot at *Sc*₂, a smaller rounded spot near the tip of *2d A*, a broad white band at the cord entirely traversing the wings, tip of the wing white including the ends of cells *R*₃, *R*₅ and parts of *R*₂ and *M*₁; it is probable that the base of the wing is also white, but this is not certain; veins dark brown except in the white markings, where they are china-white and difficult to detect; venation (Pl. XXVI, fig. 12).

Abdomen dark brownish black, valves of the ovipositor brownish yellow.

Holotype, ♀, Chiricahui Mts., Cochise Co., Ariz., June 24 (H. G. Hubbard).

Erioptera (Mesocyphona) immaculata Alexander.

1913. *Erioptera (Mesocyphona) immaculata* Alexander; Proceedings of the United States National Museum, vol. 44, pp. 518, 519, pl. 66, fig. 20.

One female from Denison, Grayson Co., Tex., June 22, 1904, taken by Mr. H. S. Barber.

Erioptera (Mesocyphona) eiseni Alexander.

1913. *Erioptera (Mesocyphona) eiseni* Alexander; Proceedings of the United States National Museum, vol. 44, pp. 516, 517, pl. 67, fig. 26.

One male collected at La Cueva, Organ Mts., Donna Ana Co., N. Mex., alt., 5,300 feet, on September 1, by Prof. C. H. T. Townsend.

Subgenus ERIOPTERA Meigen.

1803. *Erioptera* Meigen; Illiger's Magazine, vol. 2, p. 262.**Erioptera (Erioptera) dorothea** sp. n.

Cell *1st M*₂ closed, but without a spur as in *Hoplolabis*; wings spotted.

Female, length, 4.5–4.6 mm.; wing, 5.6–6.8 mm.

Rostrum and palpi dark brown. Antennæ with the basal segments brown, flagellar segments dull yellow, the apical segments brown. Head gray.

Thoracic dorsum light gray, the præscutum narrowly margined with pale in front, area in front of the pseudosutural foveæ pale, tuberculate pits dark brown. Pleuræ light gray. Halteres light yellow, the knob scarcely darker. Legs with the coxæ thinly dusted with gray, trochanters brownish yellow, femora dull yellow, the tip narrowly brown, tibiæ dull brownish yellow, the apex browned, tarsi brown. Wings light gray with brown markings as follows: a series of six large blotches along the costal margin, the second at the origin of *Rs*, third at *Sc*₂, fourth, largest, at tip of *Sc*₁ and on cross-vein *r*, fifth at the tip of *R*₁ and the last at the tip of *R*₂; brown seams along the cord, outer end of cell *1st M*₂ and at the ends of the longitudinal veins; venation (Pl. XXVI, fig. 13): cross-vein *m* present less than one-half as long as the outer deflection of *M*₃.

Abdomen grayish brown, the apical tergites and the valves of the ovipositor reddish yellow; the apical margins of the sclerites pale.

Holotype, ♀, South Fork of Eagle Creek, White Mts., N. Mex., alt. 8,000 feet, August 16 (C. H. T. Townsend).

Paratype, ♀, topotypic.

The wing-pattern is very similar to *E. (Hoplolabis) armata* O. S. of the Eastern States, but the venation is quite different.

Erioptera (Erioptera) lucia sp. n.

Cell *1st M*₂ closed and very small; pleurites of the male hypopygium bearing a triangular flattened lobe at the tip.

Male, length, 4.5 mm.; wing, 6 mm.

Female, length, 4.5 mm.; wing, 6.3 mm.

Rostrum light yellow, palpi brown. Antennæ light yellow, the flagellum broken. Head light gray.

Thoracic dorsum yellow without darker markings. Pleuræ yellow, the ventral sclerites darker and with a sparse grayish bloom. Halteres light yellow. Legs, coxæ and trochanters dull yellow, femora and tibiæ brownish yellow, tarsi brown. Wings hyaline or nearly so, the veins brown; venation (Pl. XXVI, fig. 14, which shows

the very similar *microcellula*); basal deflection of Cu_1 just before the fork of M , cell $1st\ M_2$ small, the outer deflection of M_3 and cross-vein m subequal.

Abdomen brownish yellow, sternites yellow. Hypopygium with the pleurites rather long, slender with rather abundant long pale hairs, the dorsal appendage flattened (Pl. XXVI, figs. 19, 20), triangular, the base narrowed, the tip truncate, chitinized along the margin, at the apex finely denticulate; ventral appendage shorter, at the tip bearing a chitinized hook that is directed caudad and outward: gonapophyses sharp-pointed, chitinized, decussate.

Holotype, ♂, Colorado.

Allotype, ♀, Beulah, N. Mex., alt. 8,000 feet, August (T. D. A. Cockerell).

Differs from all of the described American species except *E. microcellula* sp. n., in the small closed cell $1st\ M_2$. From *microcellula* it can be easily separated by the male genitalia.

Erioptera (Erioptera) microcellula sp. n.

Very similar to *E. lucia* in all general features, but the male genitalia are conspicuously different. The pleurites are stouter and bear an irregular appendage shaped as in the figures (Pl. XXVI, figs. 16, 17 and 18). The ventral pleural appendage is not shown in the drawings; it consists of a cylindrical fleshy lobe, narrower at the base, very densely covered with long pale hairs. The gonapophyses seen from beneath are long chitinized hooks, slightly curved inward but their tips not meeting, along the sides with numerous appressed teeth.

The wing-venation is shown in Pl. XXVI, fig. 14.

Male, length, 4.8 mm.; wing, 6.8 mm.

Holotype, ♂, Colorado.

Subgenus EMPEDA Osten Sacken.

1869. *Empeda* Osten Sacken; Mon. Dipt. N. Am., vol. 4, p. 183.

Erioptera (Empeda) alicia sp. n.

Body coloration light yellow without darker markings; cell $1st\ M_2$ closed.

Female, length, 3.5 mm.; wing, 4.9 mm.

Rostrum light yellow, palpi brown. Antennæ with the basal segments light yellow, flagellar segments light brown. Head light yellow.

Thorax light yellow without darker markings, the pleuræ of a lighter shade than the dorsum. Halteres light brown. Legs, coxæ and trochanters yellow, femora brown, more yellowish at the base,

tibiae and tarsi light yellowish brown with abundant yellow hairs. Wings hyaline or nearly so, the veins light yellow; venation (Pl. XXVI, fig. 15) as in *stigmatica* O. S., but the cross-vein *m* is present, closing the cell *1st M*₂.

Abdomen brownish yellow.

Holotype, ♀, Scotia, Cal., May 20, 1903 (H. S. Barber).

This differs from the described American forms, *stigmatica* Osten Sacken and *nigrolineata* Enderlein by its closed cell *1st M*₂ and the uniform pale yellow coloration.

Genus **RHABDOMASTIX** Skuse.

1889. *Rhabdomastix* Skuse; Proc. Linn. Soc. N. S. Wales, series 2, vol. 4, pp. 828, 829.

Subgenus **SACANDAGA** Alexander.

1911. *Sacandaga* Alexander; Entomological News, vol. 22, pp. 349-351.

Rhabdomastix (Sacandaga) caudata Lundbeck.

1898. *Goniomyia (Empeda) caudata* Lundbeck; Diptera gröenlandica, Vidensk. Meddel. fra den naturh. Foren., p. 267, pl. 6, fig. 18.

This curious fly was described from a single female taken at Permiliarsukfiord, 61°, 30' N. L., Greenland. It seems to me that the generic reference as given above is more nearly correct. The cross-vein *r* is shown in Dr. Lundbeck's figure and it is indicated in the material before me; it is probable that this species is an intermediate form in the Eriopterine series. The following material was studied: One female, Signuia, Baffin Land, August 2, 1897 (Schuchert and White). Several of both sexes, Kokanee Mt., Brit. Col., alt. 8,000 feet, August 11, 1903 (R. P. Currie).

I am greatly indebted to Dr. Lundbeck for a copy of the description and figure of this interesting fly.

Genus **GONOMYIA** Meigen.

Subgenus **GONOMYIA** Meigen.

1818. *Gonomyia* Meigen; Syst. Besch., vol. 1, p. 146.

Gonomyia (Gonomyia) obscura Doane.

1900. *Phyllolabis obscura* Doane; Journal of the New York Entomological Society, vol. 8, p. 192, pl. 8, fig. 7.

The type, a female, is No. 7,034, in the U. S. National Museum Collection; it was taken at Pullman, Wash., June 22, 1898.

Gonomyia (Gonomyia) blanda Osten Sacken.

1859. *Gonomyia blanda* Osten Sacken; Proceedings of the Academy of Natural Sciences of Philadelphia, p. 231.

The following records extend the range of the species: Peachland, B. Col., May 19, 1912. Blue Lake, Humboldt Co., Cal., June 24,

1903 (J. C. Bradley). Tex., one female in the C. V. Riley Collection in the National Museum.

Subgenus LEIPONEURA Skuse.

1889. *Leiponeura* Skuse; Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 4, p. 795.

Gonomyia (*Leiponeura*) **alexanderi** Johnson.

1912. *Elliptera alexanderi* Johnson; Psyche, vol. 19, p. 3, fig. 6.

The following additional distribution in the United States: Black Mts., Buncombe Co., N. Car., June 13, 1912 (Beutenmuller). Plano, Collin Co., Tex., August (E. S. Tucker).

Gonomyia (*Leiponeura*) **cinerea** Doane.

1900. *Dicranomyia cinerea* Doane; Journal of the New York Entomological Society, vol. 8, pp. 182, 183, pl. 7, fig. 2.

The type, a female, is No. 7,005 in the U. S. National Museum Collection; it was taken at Pullman, Wash., August 10, 1898.

Gonomyia (*Leiponeura*) **manca** Osten Sacken.

1869. *Goniomyia manca* Osten Sacken; Monographs of the Diptera of North America, vol. 4, pp. 178, 179.

1908. *Dicranomyia curvivena* Coquillett; Proceedings of the Entomological Society of Washington, vol. 9, p. 144.

Coquillett's types were examined in Washington and proved to belong to this species.

Gonomyia (*Leiponeura*) **puer** Alexander.

1913. *Gonomyia (Leiponeura) puer* Alexander; Proceedings of the United States National Museum, vol. 44, p. 506, pl. 66, fig. 14.

Miami, Dade Co., Fla., December 19, 1912 (Fred'k Knab). Billy's Island, Okefenoke Swamp, Charlton Co., Ga., June 25, 1912 (Bradley and Leonard); several specimens of both sexes.

Gonomyia (*Leiponeura*) **sacandaga** sp. n.

Coloration yellow and brown; pleuræ striped; wings with the costa strongly yellow, stigma pale brown.

Male, length, 3.2-3.4 mm.; wing, 3.3-3.5 mm.

Rostrum and palpi dark brownish black. Antennæ with the two basal segments light yellow, the flagellum brown. Head light yellow with a dark brown spot in the middle.

Mesonotal præscutum rather dark brown, narrowly edged around with light yellow; scutum pale yellow medially, the lobes brown margined with yellow behind; scutellum brown, broadly margined with yellow behind; postnotum brown. Pleuræ striped brown and yellow; the dorsal pleurites light yellowish brown, limited above by the bright yellow margin of the præscutum, limited below by the dorsal pleural stripe which begins beneath the base of the halteres

and goes to above the fore coxa; lower pleural stripe broader, traversing the coxæ, the yellow band between these dark stripes very clear, at the anterior end including most of the fore coxa. Halteres light yellow. Legs, coxæ as described above, trochanters dull yellow, femora brown broadly tipped with dark brown, tibiæ and tarsi dark brown. Wings light gray, the costal margin conspicuously light yellow; cells *C*, *Sc* and *R*₁ pale, almost hyaline; stigma pale brown, oval; veins brown; venation (Pl. XXVII, fig. 25): *Sc* ending far before the origin of *Rs*, the distance equal to two-thirds the length of the sector.

Abdominal tergites dark brown, the apical third of each sclerite yellow, the lateral margin narrowly yellowish; hypopygium reddish; sternites brown, the extreme apex of each sclerite yellowish. Hypopygium (Pl. XXVI, fig. 21) with the pleurites rather long, slender, with a few rather long hairs on the outer face near the tip, bearing two appendages; of these the more dorsal is stouter, paler and less chitinized on its basal two-thirds, the apex a strong chitinized tooth with numerous pale hairs around its base; this appendage is connected basally with the long, flattened basal appendage, which is a little truncated at its apex, shaped as in the figure. The ventral lobe of the pleura is produced into a short fleshy conical lobe provided with long hairs. The dorsal gonapophyses are short, curved, strongly chitinized beyond the curve, pointed at the tip, with two or three blunt teeth on the cephalic or under face of the hook.

Holotype, ♂, Sport Is., Sacandaga R., Fulton Co., N. Y., August 24, 1910 (Alexander).

Allotype, ♀, topotypic.

Paratypes, 50 ♂ ♀, topotypic, July 5 and July 27, 1909.

? *Gonomyia slossonæ* sp. n.

Cell 1st *M*₂ open by the atrophy of the outer deflection of *M*₃; cell *M*₁ absent.

Female, length, 6-7 mm.; wing, 6-6.8 mm.

Rostrum brown at the tip, yellowish at the base; palpi dark brown. Antennæ brown. Head light yellow.

Thoracic pronotum yellow with a brown spot on either side. Präscutum light yellow with dark brown stripes, the median one darker in front, behind somewhat divided by a pale line; the lateral stripes begin behind the pseudosutural foveæ and are entirely confluent with the middle stripe; pseudosutural foveæ chestnut, very far proximad; scutum yellow, the lobes largely dark brown; scutellum dull yellow; postnotum brown, yellowish on the sides in front.

Pleuræ, dorsal pleurites purplish brown, sternum lighter grayish brown, the two enclosing a broad light yellow stripe beginning behind the fore coxa and ending above the hind coxa. Halteres pale brown, the knob a little darker. Legs with the coxæ and trochanters dull yellow, femora and tibiæ yellow, the latter a little darkened at the tip, tarsi dark brown. Wings light brown, stigma small, rather indistinct, veins brown; venation (Pl. XXVII, fig. 26): Sc_2 far removed from the tip of Sc_1 ; cross-vein r rather indistinct at the fork of R_{2+3} ; cell M_1 absent; outer deflection of M_3 absent; basal deflection of Cu_1 at the fork of M .

Abdomen dark brown, the pleural line and the genital segment yellowish.

The paratype has the two basal segments of the antennæ yellowish, the head behind gray, cross-vein r very indistinct, basal deflection of Cu_1 before the fork of M .

Holotype, ♀, Biscayne Bay, Dade Co., Fla. (Mrs. A. T. Slosson).

Paratype, ♀, Paraiso, Canal Zone, January 29, 1911 (Aug. Busck).

I was unable to detect tibial spurs on this insect. The general appearance is more like that of a *Linnophila* than any other form known to me and I refer it to *Gonomyia* with considerable doubt. The long Sc and cross-vein r are not typical of *Gonomyia*.

Genus **CLADURA** Osten Sacken.

1859. *Cladura* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 229.

Cladura delicatula sp. n.

From the only described American species, *C. flavo-ferruginea* O. S. (= *indivisa* O. S.), this form differs in its very much smaller size and pale coloration. The specimens of *indivisa* mentioned by Osten Sacken,² where he states "some of the specimens, probably recently excluded, were pale and without spots," may have belonged to this form. There are no brown spots on the pleuræ; the extreme lateral margin of the abdominal tergites is dark; the wings are hyaline and lack the dark markings on the cord, origin of the sector and on the outer deflection of cell 1st M_2 . I have compared this insect with the extensive series of *Cladura* studied by Mr. Leonard and myself³ and have no doubt of its specific distinctness. The wing is figured in Pl. XXVII, fig. 27.

Female, length, 4.6–4.7 mm.; wing, 5.6–5.7 mm.

² Mon. Dipt. N. Am., vol. 4, p. 189.

³ Venational variation in *Cladura*, *Journ. N. Y. Entomological Society*, vol. 20, pp. 36–39, 1912.

Holotype, ♀, White Mts., N. Hamp. (H. K. Morrison).

Paratypes, 2 ♀, topotypic.

Tribe **Limnophilini**.

Genus **LIMNOPHILA** Macquart.

1834. *Limnophila* Macquart; Suit. a Buffon, vol. 1, p. 95.

Limnophila albipes Leonard.

1913. *Limnophila albipes* Leonard; Entomological News, vol. 25, pp. 248-249, fig.

One male of this species was taken by Mr. S. Frost at Tarrytown, Westchester Co., N. Y., June 16, 1913. This constitutes the first record for the State.

Limnophila alleni Johnson.

1909. *Limnophila alleni* Johnson; Proceedings of the Boston Society of Natural History, vol. 34, pp. 126, 127, pl. 16, fig. 18.

This fine species was described from a single male. A male specimen was taken in Coy Glen, Ithaca, N. Y., June 20, 1910, by Miss Anna H. Morgan. Another male in Simmon's woods, Gloversville, N. Y., June 9, 1914, by the author. There is a badly injured female in the Cornell Collection, taken in North Carolina by H. K. Morrison; this specimen has a strong cross-vein in cell R_5 in both wings uniting R_{4+5} with M_1 . A second female was taken at Sugar Grove, Fairfield Co., O., May 19, 1901, by Prof. J. S. Hine; the female never having been described, I make this specimen the allotype and characterize this sex as follows:

Allotype, ♀: Head dark brown; abdominal segments 2 to 4 bright orange-yellow, the caudal median portion brown, smallest on segment 2, largest on segment 4; segments 5 to the end of the body brownish yellow with a narrow darker median stripe; sternites yellow with a narrow median brown stripe extending the length of the segment; no black band on the middle of the fore femora.

Female, length, 36 mm.; wing, 22 mm.

Specimen in the author's collection.

Limnophila subcostata Alexander.

1911. *Phylidorea subcostata* Alexander; Canadian Entomologist, vol. 43, pp. 288, 289.

Since this species was first described it was found to be rather common in the bogs, deep woods and gorges in May and early June. The species has not been figured hitherto and I show its venation in Pl. XXV, fig. 1. A male from Fall Creek, Ithaca, N. Y., May 7, 1913; a second male from the same place on May 13, 1913; a male from Bear Creek bog, Freeville, N. Y., May 29, 1913. Several females

swept from rank vegetation at Sacandaga Park, Fulton Co., N. Y., June 1, 1914. Three females taken in Simmon's woods, Gloversville, N. Y., June 3, 1914, in company with a crane-fly fauna that is quite characteristic of northern woodlands that support a rich Canadian flora. (*Dicranomyia pubipennis*, *Rhypholophus rubellus*, *Erioptera stigmatica*, *Adelphomyia minuta*, *Limnophila rufibasis*, *L. areolata*, *Rhaphidolabis flaveola*, *Tricyphona calcar*, etc.)

Subgenus EPHELIA Schiner.

1863. *Ephelia* Schiner; Wien. Entomol. Monatschr., vol. 7, p. 222.

Limnophila (*Ephelia*) *johnsoni* sp. n.

Color yellow; wings hyaline, unmarked; a supernumerary cross-vein in cell *M*.

Male, length, 4 mm.; wing, 6.1 mm.

Female, length, 7.2 mm.; wing, 8.6 mm.

Rostrum pale brownish yellow; palpi and antennæ very pale yellowish brown. Head yellow with a pale bloom, eyes conspicuously contrasting, black.

Pronotum pale yellow. Mesonotal præscutum pale yellow with four broad indistinct darker stripes, of which the median pair are the longest; scutum, scutellum and postnotum light yellow with a sparse pale gray bloom. Pleuræ yellowish. Halteres pale yellow. Legs yellow, the tibiæ and tarsi a little suffused with brown. Wings pale yellow, the veins pale; venation (Pl. XXV, fig. 2): *Rs* rather long, angulated at base, in a line with the deflection of R_{2+3} ; cross-vein *r* not distinct; basal deflection of R_{4+5} and M_{1+2} strongly arcuated and in a line; a strong supernumerary cross-vein in cell *M*.

Abdomen very light brownish yellow.

Holotype, ♂, Mountain Lake, Fulton Co., N. Y., alt. 1,590 feet, June 17, 1914 (C. P. Alexander).

Allotype, ♀, Bretton Woods, N. H., June 23, 1913 (C. W. Johnson).

This interesting new species is named in honor of the well-known dipterologist, Mr. Charles W. Johnson, who collected the allotype. The only other species of *Ephelia* in America are *aprilina* O. S. and *superlineata* Doane which have the wings heavily spotted with brown.

Subgenus DACTYLOLABIS Osten Sacken.

1859. *Dactylolabis* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 240.

Limnophila (*Dactylolabis*) *hortensia* sp. n.

Wings subhyaline; color gray, hypopygium reddish.

Male, length, about 8 mm.; wing, 8.8 mm.

Female, length, 7.8–8.4 mm.; wing, 8.4–8.8 mm.

Rostrum and palpi brown. Antennæ with the basal segment very elongate, dark brown, flagellum dark brown. Head gray.

Thoracic dorsum light gray, the præscutum with darker markings, a very indistinct stripe on either side of the middle line, a more distinct stripe on either side, narrowest in front. Pleuræ light gray. Halteres pale yellow. Legs, coxæ and trochanters yellow, femora yellow darkened at the tip, tibiæ brownish yellow, brown at the tip, tarsi brown. Wings subhyaline or faintly yellowish, stigma indistinct, veins brown; venation (Pl. XXVII, fig. 29): R_{2+3} about as long as the basal deflection of Cu_1 ; cross-vein r at about two-thirds the length of R_2 .

Abdominal tergites gray, the hypopygium reddish yellow; sternites blackish gray, each segment with more or less yellow at the base.

Holotype, ♂, London Hill Mine, Bear Lake, Brit. Col., alt. 7,000 feet, July 29, 1903 (A. N. Caudell).

Allotype, ♀, topotypic.

Paratypes, 10 ♂ ♀, topotypic.

In the U. S. National Museum Collection this material was determined as *L. cubitalis* Osten Sacken, and by Osten Sacken's key⁴ it would run down to that species. The following differences suffice to separate the forms:

1. The extreme base of R_2 is perpendicular to the end of the sector; cell R_2 very long and narrow; wings more tinged with yellow; hypopygium concolorous with the rest of the abdomen; size larger (Eastern United States)..... *cubitalis* Osten Sacken.
- R_2 leaves the end of the sector at an angle; cell R_2 shorter, not so elongated; wings nearly hyaline; hypopygium reddish, conspicuously brighter than the rest of the abdomen; size smaller (British Columbia)..... *hortensia*, sp. n.

***Limnophila nigripleura* A. and L. sp. n.**

Belongs to the *luteipennis* Osten Sacken group; wings clear; pleuræ with a conspicuous dark brown stripe from the cervical sclerites to the postnotum.

Male, length, 4.8–5 mm.; wing, 5.8–6 mm.

Female, length, 6 mm.; wing 7 mm.

Palpi and antennæ dark brownish black. Head light clear gray, provided with numerous hairs.

Pronotum dusted with gray. Mesonotal præscutum and scutum

⁴Mon. Dipt. N. Am., vol.4, pp. 202, 203.

light brown, rather darker medially; scutellum more yellow medially; postnotum gray. Pleuræ dull light yellow with a broad dark brown stripe extending from the cervical sclerites to the postnotum; mesosternum suffused with brown. Halteres light yellow, the knobs darker. Legs, coxæ and trochanters dull yellow, femora brownish yellow, tibiæ similar, the tip narrowly brown, tarsi brown. Wings subhyaline, stigma indistinct, veins brown; venation (Pl. XXV, fig. 3).

Abdominal tergites dark brown, sternites much paler, yellowish white, hypopygium brown.

Holotype, ♂, Sacandaga Park, Fulton Co., N. Y., June 20, 1910.

Allotype, ♀, topotypic.

Paratypes, 50 ♂ ♀, topotypic; Mountain Lake, Fulton Co., N. Y., alt. 1,580 feet, June 15, 1914; Orono, Penobscot Co., Me., July 29, 1913; Ithaca, Tompkins Co., N. Y., July 7, 1911; Ridgewood, Bergen Co., N. J.

A common and widely distributed species in the Eastern United States; the material has been compared with the types of *contempta* in the Museum of Comparative Zoology, and the form differs as described above. The species has been in the collection of Mr. Leonard and myself for some years.

A key to the species of the *luteipennis* group in the Eastern United States.

1. Cell M_1 absent..... *noveboracensis* Alex.⁵
- Cell M_1 present..... 2.
2. Wings with small brown dots on the cross-veins and at the forks,
luteipennis O. S.⁶
- Wings clear, unspotted..... 3.
3. Thorax clear blue-gray..... *inornata* O. S.⁷
- Thorax brownish without gray color..... 4.
4. Larger species with the pleuræ unmarked..... *contempta* O. S.⁸
- Smaller species; pleuræ with a conspicuous dark brown stripe
from the cervical sclerites to the postnotum,
nigripleura A. & L., sp. n.

The members of the *luteipennis* group have the following characters in common: head narrow and prolonged behind; pronounced pseudosutural or humeral pits; conspicuous tuberculate pits on either side of the middle line of the præscutum in front. Venation

⁵ *noveboracensis* Alexander; *Pysche*, vol. 18, pp. 196 to 198; 1911.

⁶ *luteipennis* Osten Sacken; *Proc. Acad. Nat. Sci. Phila.*, p. 236; 1859.

⁷ *inornata* Osten Sacken; *Mon. Dipt. N. Am.*, vol. 4, pp. 219, 220; 1869.

⁸ *contempta* Osten Sacken; *l.c.*, pp. 218, 219; 1869.

of the wings, cells R_3 and $1st M_2$ longer than cell R_5 ; radial and medial veins long and slender; second anal vein incurved at the tip.

Limnophila novæ-angliæ sp. n.

Belongs to the *adusta* Osten Sacken group; wings hyaline; body coloration yellowish; abdomen of the male with a black subterminal ring.

Male, length, 6.8-7.5 mm.; wing, 5.8-7.2 mm.

Female, length, 8 mm.; wing, 7.5 mm.

Rostrum yellowish, palpi brown. Antennæ, basal segments brownish yellow, the first four or five flagellar segments with the extreme base yellowish, remainder of the antennæ brown. Head with a broad purplish brown band across the vertex from one eye to the other; occiput rather abruptly reddish yellow.

Thoracic notum reddish yellow without stripes. Pleuræ lighter yellow. Halteres short, rather pale, the knob only a little darker. Legs, coxæ and trochanters yellow, femora and tibiæ yellow, the tips narrowly brown; metatarsus dull yellowish basally, tipped with brown, remaining tarsal segments brown. Wings with a faint yellowish tinge, a pale brown, oval stigma, no infuscation at the tip of the wing; venation (Pl. 1, fig. 4).

Abdomen brownish yellow with a conspicuous subapical black ring including segments 8 and 9 and the caudal half of 7; hypopygium reddish yellow.

The female sex is similar, but the abdomen lacks the black subapical ring, and in some specimens the entire head is dark purplish brown.

Holotype, ♂, Ellsworth, Hancock Co., Me., August 10, 1913 (Miss Cordelia J. Stanwood).

Allotype, ♀, topotypic.

Paratypes, 1 ♂, 4 ♀, type-locality, July 9 to August 10, 1913.

A key to the species of the *adusta* group in the eastern United States.

1. Wings more or less clouded with brown apically; often with brown seams on the cross-veins..... 2.
- Wings uniform in coloration, the stigma indistinct..... 3.
2. Yellowish species, the thoracic notum light yellow..... *adusta* O. S.⁹
- Brown species, the thoracic notum dark brown..... *similis* Alex.¹⁰
3. Larger species (wing of male, 9.5 mm.); abdomen without a black subterminal ring in the male..... *lutea* Doane¹¹
- Small species (wing of male less than 7.5 mm.); abdomen of the male with a black subterminal ring..... *novæ-angliæ*, sp. n.

⁹ *adusta* Osten Sacken, *Proc. Acad. Nat. Sci. Phila.*, p. 235; 1859. Mon. Dipt. N. Am., vol. 4, pp. 215-217; 1869.

¹⁰ *similis* Alexander; *Psyche*, vol. 18, pp. 195, 196; 1911.

¹¹ *lutea* Doane; *Journ. N. Y. Ent. Soc.*, vol. 8, p. 191; 1900.

The members of the *adusta* group are distinguished by the following characters: radial sector short, arcuated; cross-vein *r* situated at about mid-length of *R*₂ which is quite oblique. The species are yellowish or brown and specimens in a single species vary much in the intensity of their coloration.

The following species have been examined and prove to belong to this group of the genus:

Limnophila fulvocostalis Coquillett,¹² from Bering Islands, type 4,049 U. S. N. M.

Limnophila costata Coquillett,¹³ from New Mexico, type 5,318 U. S. N. M.

Limnophila insulana Johnson,¹⁴ from Bermuda, type in the collection of Mr. Johnson.

Limnophila stanwoodæ sp. n.

Belongs to the *quadrata* Osten Sacken group; body-coloration yellow; wings pale yellow; *Rs* long, cell *M*₁ absent.

Male, length, 6.6-6.9 mm.; wing, 7.5-7.9 mm.

Female, length, 6.8-7.2 mm.; wing, 6.8-7.3 mm.

Rostrum yellowish, palpi with the basal segments light colored, terminal two brown. Antennæ with the scape yellow, flagellum brown, the proximal half of the first two flagellar segments yellowish. Head reddish yellow.

Thorax brownish yellow without distinct dark lines, the postnotum with a narrow indistinct median stripe of brown. Pleuræ, pro-pleuræ darker, the meso- and metapleuræ light yellow. Halteres pale yellow. Legs, coxæ and trochanters light yellow, femora brownish yellow darkening into brown at the tip, tibiæ light brown darker at the tip, tarsi dark brown. Wings with a light yellow tinge, the stigma gray, oval, veins brown, the radial cross-vein mostly obscured by the stigma; venation (Pl. XXV, fig. 5).

Abdomen brownish yellow, the lateral line brownish; sternites a little brighter yellow; segment 8 and the caudal half of the 7th brown; hypopygium yellowish; valves of the ovipositor of the female long, acicular.

Holotype, ♂, Sacandaga Park, Fulton Co., N. Y., June 11, 1914.

Allotype, ♀, topotypic.

Paratypes, 3 ♂, 18 ♀, Ellsworth, Hancock Co., Me., June 21-July 23, 1913.

¹² Fur Seals and Fur-Seal Islands, vol. 4, p. 342; 1899.

¹³ *Psyche*, vol. 9, p. 149; 1901.

¹⁴ The Dipteran Fauna of Bermuda, *Annals of the Entomological Society of America*, vol. 6, pp. 443, 444, fig. 2; 1913.

The paratypes were collected by Miss Cordelia J. Stanwood, the well-known student of bird-life, in whose honor the species is named. Miss Stanwood has done much to discover the craneflies in the vicinity of her home city, and as a result of her careful observations our knowledge of the Hancock Co. Tipulidæ is remarkably complete and constitutes one of the most valuable lists of a restricted locality that has ever been secured.

Limnophila osborni sp. n.

Belongs to the *quadrata* Osten Sacken group; mesonotum rich brown; pleuræ with a conspicuous black dorsal stripe; wings with a brown tinge; cross-vein *r* at the fork of R_{2+3} ; *Rs* long, cell M_1 absent.

Male, length, 6.3–6.5 mm.; wing, 7.4–7.5 mm.

Rostrum a little reddish yellow, palpi and antennæ dark brownish black. Head dark brownish black.

Mesonotal præscutum rich yellowish brown with a very narrow black line on either side of the broad median space, a deep black spot on the anterior margin of the præscutum continued forward onto the pronotal sclerites, lateral stripes not clearly indicated; scutum yellowish brown with a darker brown suffusion on each lobe; scutellum dull yellow; postnotum clear light gray. Pleuræ pale yellowish with a broad deep black stripe extending from the cervical sclerites across the dorsal pleural sclerites to the abdomen; the pleuræ adjoining this broad conspicuous stripe very narrowly gray pruinose; sternal sclerites pale dull yellow. Halteres rather long, pale, the knob elongate, dark. Legs, coxæ and trochanters pale yellow, femora brownish yellow, the tip darker, tibiæ and tarsi dark brown. Wings with a brown tinge, veins dark brown; venation (Pl. XXV, fig. 6): cross-vein *r* at the fork of R_{2+3} .

Abdominal tergites shining black; sternites dark brownish black; basal sternites with some yellow; hypopygium reddish brown.

The paratype from Phair, Me., shows the mesonotal præscutum very dark brown medially, a little lighter behind, lobes of the scutum shiny black.

Holotype, ♂, Phair, Aroostook Co., Me., August 26, 1913 (Herbert Osborn).

Paratypes, 1 ♂ with the type; 2 ♂ from the Bangor Bog, near Orono, Penobscot Co., Me., August 30, 1913 (Herbert Osborn).

This interesting late summer member of the *quadrata* group is named in honor of Dr. Herbert Osborn, who collected the type material.

A key to the species of the *quadrata* group in the eastern United States.

1. Mesonotum and pleuræ yellowish or brownish yellow; wings pale yellow; size small.....*stanwoodæ* sp. n.
Mesonotum and pleuræ not yellow; size larger..... 2.
2. Pleuræ and mesonotum clear bluish black with a gray bloom, only the coxæ conspicuously light yellow; wings with a yellowish tinge; cross-vein r beyond the fork of R_{2+3} on R_2 ,
quadrata O. S.¹⁵
Pleuræ with a conspicuous black dorsal stripe; mesonotum rich brown; wings with a brown tinge; cross-vein r at the fork of R_{2+3}*osborni* sp. n.

The members of the *quadrata* group have the radial sector long and in a line with R_{2+3} ; cells R_3 , R_5 and 1st M_2 in a line or nearly so; cell M_1 absent.

Limnophila emmelina sp. n.

Brown, abdomen hairy; wings brown; cell R_2 sessile; cell M_1 absent.

Male, length about 7 mm.; wing, 8.9 mm.

Rostrum very short, reddish brown, the palpi brown. Antennæ rather short, dull yellowish brown. Head reddish brown.

Thoracic dorsum yellowish brown without distinct darker markings. Pleuræ dull yellow. Halteres yellow. Legs, coxæ and trochanters dull yellow, femora yellow, broadly tipped with brown, tibiæ dull yellow, rather narrowly tipped with brown, tarsi brown, the base of the metatarsus a little paler. Wings with a slight brownish tinge, no stigmal spot, veins brown; venation (Pl. XXVII, fig. 28): R_2 arising from the sector so that the cell R_2 is sessile; cell M_1 absent.

Abdominal tergites dark brown, sternites lighter colored. Holotype, ♂, Great Falls, Va., April 20, 1913 (Fred'k Knab).

From other members of the genus in which cell M_1 is lacking this species is readily distinguished by the sessile cell R_2 .

Tribe **Pedicini.**

Genus **ORNITHODES** Coquillett.

1900. *Ornithodes* Coquillett; Proc. Wash. Acad. Sci., vol. 2, p. 400.

Ornithodes harrimani Coquillett.

1900. *Ornithodes harrimani* Coquillett; Proceedings of the Washington Academy of Science, vol. 2, p. 400.

The type is No. 5,203 in the U. S. National Museum. It is a male from Virgin's Bay, Alaska, June 26, 1899. This insect is very similar to *Tricyphona* in venation, but distinct in the curious

¹⁵*quadrata* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 241; 1859; Mon. Dipt. N. Am., vol. 4, p. 230; 1869.

elongate rostrum, from which character Coquillett evidently derived the generic name.

Genus **TRICYPHONA** Zetterstedt.

1838. *Tricyphona* Zetterstedt: Ins. Lapponica, Dipt., p. 851.

Tricyphona katahdin sp. n.

Color light brown; wings light yellow with sparse brown seams and spots; cross-vein *m-cu* lacking.

Male, length, 6-7.6 mm.; wing, 6-6.9 mm.

Female, length, 8.8-9.5 mm.; wing, 7.5-9 mm.

Palpi dark brownish black, rostrum and head brownish gray, clearer gray on the vertex adjoining the eyes; first segment of the antennæ pale yellow, remainder of the antennæ dark brown.

Mesonotal præscutum light fawn-brown with an indistinct brownish stripe on either side of the middle line and shorter lateral pale brown stripes, these latter continued caudad onto the lobes of the scutum; scutellum grayish; postnotum light yellowish brown with a whitish bloom. Pleuræ light yellow. Halteres pale, the knob a little darker. Legs yellow, coxæ and trochanters brownish yellow, femora yellow darkening into brown on the apical half or more, tibiæ and tarsi dark brown. Wings light yellow, the veins yellow; small brown markings as follows: a rounded spot on Sc_2 continued up into the costal cell; an oval spot at Sc_1 ; brown seams at the base of R_s , base of R_{2+3} , cross-vein *r*, tip of R_{2+3} , fork of R_{4+5} , cross-vein *r-m*; venation (Pl. XXV, fig. 7): cell R_4 much shorter than cell R_3 , usually one-half as long; cell M_1 very short usually about equal to its petiole beyond cross-vein *m* or a little longer; cell *1st* M_2 very long, narrow; Cu_1 and M_3 fused for a distance obliterating cross-vein *m-cu*.

Abdominal tergites with the basal two-thirds brown, apical third yellowish; sternites dull brownish yellow, margined laterally with brown, the apical segments with the margin reduced or lacking; hypopygium pale.

The female is similar to the male, but larger, especially the abdomen; brown tips to the femora narrower; abdomen usually with more yellow color, often with a broad median patch of yellowish on the tergites.

In some of the males the scapal segments of the antennæ are dark brown, concolorous with the rest of the antennæ.

There is some variation in venation in the series, the fusion of M_3 and Cu_1 is sometimes lacking, the cross-vein *m-cu* being present as in *vernalis* Osten Sacken; one female lacks cross-vein *m* in both wings.

Holotype, ♂, at the foot of Mt. Katahdin, Piscataquis Co., Me., along the Abol trail; altitude about 1,000 feet, August 22, 1913 (Alexander).

Allotype, ♀, topotypic.

Paratypes, 9 ♂, 5 ♀, topotypic (Morse and Alexander). 1 ♂, 1 ♀, Ellsworth, Hancock Co., Me., August 26 and September 1, 1913 (C. J. Stanwood).

Paratypes have been deposited in the Museum of Comparative Zoölogy (through Prof. Morse); Boston Society of Natural History, Maine Experiment Station, American Museum of Natural History, The Academy of Natural Sciences of Philadelphia, and the U. S. National Museum.

Related to *Tricyphona vernalis* Osten Sacken (Pl. XXV, fig. 8), but is a very different species. The size, sex for sex, is smaller; no sign of the gray coloration so characteristic of *vernalis*; wings much paler, yellowish, and the markings are reduced to mere spots and narrow seams as described above, not conspicuous rounded clouds. In normal individuals of both species, *vernalis* has cross-vein *m-cu* present and cell M_3 consequently very long; *katahdin* has Cu_1 and M_3 fused for a greater or less length; the forks of cell M_1 and R_4 are much shorter in *katahdin* than in *vernalis*.

Genus **POLYANGÆUS** Doane.

1900. *Polyangæus* Doane; Journ. N. Y. Ent. Soc., vol. 8, p. 196.

Polyangæus maculatus Doane.

1900. *Polyangæus maculatus* Doane; Journal of the New York Entomological Society, vol. 8, p. 197, pl. 8, fig. 20.

The type is apparently not in the collection of the U. S. National Museum with the remaining Doane types. There are a few specimens from Eureka, Humboldt Co., Cal., May 22, 1903, taken by Mr. H. S. Barber.

Genus **DICRANOTA** Zetterstedt.

1838. *Dicranota* Zetterstedt; Ins. Lapponica, Dipt., p. 851.

Dicranota pallida sp. n.

Size large, wing over 7 mm.; body coloration light yellow; cell M_1 present, deep; cross-vein *m* present.

Female, length, 8 mm.; wing, 8.1 mm.

Rostrum and palpi pale yellow. Antennæ with the two basal segments pale yellow, the flagellum broken. Head yellow.

Thoracic dorsum light yellow, lobes of the scutum, basal portion of the scutellum and the postnotum more brownish. Pleuræ dull yellow. Halteres broken. Legs, coxæ and trochanters dull yellow,

femora yellow, a little darker at the tip, tibiæ and tarsi dull yellow, the tips of the individual segments a little darkened. Wings broad, hyaline, highly iridescent, veins brown; venation (Pl. XXVII, fig. 31): *Rs* long, angled and spurred near its origin; cell *1st M*₂ closed; cell *M*₁ present and very deep, its petiole very short so that the cell is almost sessile.

Abdomen dull yellow.

Holotype, ♀, White Mts., N. H. (H. K. Morrison).

This insect agrees with *argentea* Doane and *noveboracensis* sp. n., in the presence of cell *M*₁ of the wings. The pale coloration and the closed cell *1st M*₂ readily separate it from these species. The related *Rhaphidolabis flaveola* O. S. has the petiole of cell *M*₁ long, the radial sector short, no supernumerary cross-vein in cell *R*₁, etc.

***Dicranota noveboracensis* sp. n.**

Body coloration gray; size small (length about 6 mm.); wings with cell *M*₁ present.

Male, length, 5.5–6.3 mm.; wing, 6.6–7.5 mm.

Female, length, 6–6.5 mm.; wing, 7.8–8 mm.

Rostrum, palpi and antennæ dark brown, the flagellar segments short, oval. Head brownish gray, paler around the eyes, a very narrow dark brown median stripe.

Thoracic dorsum gray with three dark brown stripes on the dorsum, the middle stripe broadest, extending the length of the præscutum, faintly bisected by a narrow pale median line; lateral stripes short, beginning at about midlength of the præscutum, extending back onto the scutum where they suffuse the lobes; scutellum and postnotum light gray. Pleuræ light gray. Halteres pale. Legs, coxæ brown with a sparse gray bloom on the outer face, trochanters yellowish brown, remainder of the legs brown. Wings light gray, the stigmal spot pale brown, not completely filling the space between the cross-veins in the radial cells, veins dark brown; venation: *Rs* rather elongate, oblique; cell *M*₁ present. The venation is figured in Needham's paper, 23d Report of the N. Y. State Entomologist for 1907, pl. 19, fig. 1 (as *rivularis* Osten Sacken).

Abdomen light brownish gray.

Holotype, ♂, Fall Creek, Ithaca, N. Y., May 8, 1914.

Allotype, ♀, topotypic.

Paratypes, 4 ♂, 1 ♀, topotypic, 1 ♂, 1 ♀, Dolgeville, Fulton Co. N. Y., May 16, 1914.

The American species of *Dicranota* may be separated by the following key.

1. Cell M_1 absent 2.
Cell M_1 present 3.
2. Halteres with the knob darkened; antennæ of the male much longer than the thorax (eastern United States) . . . *eucera* O. S.¹⁶
Halteres pale; antennæ of the male short (eastern United States),
rivularis O. S.¹⁷
3. Cell $1st M_2$ present; body-coloration yellowish (eastern United States) *pallida* sp. n.
Cell $1st M_2$ absent; body-coloration grayish 4.
4. Size large (length of female 9 mm.) (western United States),
argentea Doane¹⁸
Size small (length of the female 6 mm.) (eastern United States),
noveboracensis sp. n.

Genus **RHAPHIDOLABIS** Osten Sacken.

1869. *Rhaphidolabis* Osten Sacken; Mon. Dipt. N. Am., vol. 4, p. 284.

Rhaphidolabis polymeroides sp. n.

Antennæ elongated, much longer than the head and thorax together, the segments of the flagellum with abundant outstretched hairs; wings with a brown suffusion.

Male, length about 6-6.5 mm.; wing, 7.4 mm.

Rostrum brown, palpi dark brownish black. Antennæ elongated, if bent backward they would extend to the middle of the abdomen; flagellar segments very long, cylindrical, with abundant outstretched hairs. Head gray.

Thoracic dorsum brown with three dark brown stripes, the median one longest and broadest, the lateral stripes short, narrowed in front, broader behind; scutum with the lobes dark brown these being continuations of the lateral præscutal stripes; scutellum and postnotum brown with a sparse gray bloom. Pleuræ brownish gray. Halteres long, pale at the extreme base, knob dark brown. Legs, coxæ brown, more yellowish at the tips, trochanters yellow, femora yellow darkening into brown beyond the base, tibiæ and tarsi brown. Wings with a dark brown suffusion, stigma indistinct, veins dark brown with conspicuous hairs; venation (Pl. XXVII, fig. 30).

Abdominal tergites dark brown, the hypopygium lighter brown; sternites more yellowish.

Holotype, ♂, Eureka, Cal., May 22, 1903 (H. S. Barber).

This insect is conspicuously different from any of the described

¹⁶ *eucera* Osten Sacken; Mon. Dipt. N. Am., vol. 4, pp. 281, 282; 1869.

¹⁷ *rivularis* Osten Sacken; *Proc. Acad. Nat. Sci. Phila.*, p. 249, pl. 2, fig. 16; 1859.

¹⁸ *argentea* Doane; *Journ. N. Y. Ent. Soc.*, vol. 8, p. 196, pl. 8, fig. 19; 1900.

Dicranotæ. The resemblance of this insect to species of *Polymera* is remarkable.

Tribe **Hexatomini.**

Genus **ERIOCERA** Macquart.

1838. *Eriocera* Macquart; Dipt. exot., vol. 1, No. 1, p. 74.

Eriocera tristis sp. n.

Abdomen shining black; wings with a blackish suffusion; cross-vein *r* at the fork of R_{2+3} .

Female, length, 12 mm.; wing, 10–10.8 mm.

Rostrum and palpi brown. Antennæ reddish brown. Head dark brownish black, much paler, yellowish, along the margin of the eye and a pale spot behind the frontal tubercle. Frontal tubercle conspicuous, shiny, without hairs, deep chestnut-brown with a V-shaped notch in front.

Thorax with the pronotum dark brownish black; mesonotum very dark brown with four indistinct blackish stripes, the middle pair longest, divergent in front, the lateral pair abbreviated; scutum and scutellum brown, the latter with a sparse gray bloom; postnotum black. Pleuræ dark brown. Halteres dark brownish black. Legs, coxæ brown, trochanters dull yellow, femora full yellow at base, darkening into brown at the swollen tips; tibiæ reddish brown, tarsi brown. Wings blackish brown, stigma oval, dark brown; venation: cross-vein *r* at the fork of R_{2+3} ; cell 1st M_2 small, almost square; basal deflection of Cu_1 beyond the fork of M . (The venation is figured in *Psyche*, vol. 19, pl. 13, fig. 8; 1912.)

Abdominal tergites dark shiny black, the terminal segment and the ovipositor reddish brown; sternites yellowish, apices of the segments dark brownish black, sometimes the yellow color indistinct.

Holotype, ♂, Fall Creek, Ithaca, N. Y., August 1, 1912 (Alexander).

Allotype, ♀, topotypic.

Paratypes, 1 ♀, topotypic, (Carl Ilg). 2 ♀, topotypic (Carl Ilg).

I examined the types of *fuliginosa* O. S. on September 11, 1913. The wing is suffused with rather light brown; stigma small, rounded, brown; cross-vein *r* just beyond the fork of R_{2+3} . *E. tristis* may be told by the very dark color of the wings and the deep black abdomen; this is the species mentioned by me in *Psyche*, December, 1912, p. 169, under the account of *E. fulltonensis*.

Subfamily CYLINDROTOMINÆ.

Genus **CYLINDROTOMA** Macquart.1834. *Cylindrotoma* Macquart; Suit. a Buffon, vol. 1, p. 107.**Cylindrotoma splendens** Doane.1900. *Cylindrotoma splendens* Doane; Journal of the New York Entomological Society, vol. 8, p. 197, pl. 8, fig. 21.1900. *Cylindrotoma juncta* Coquillett; Proceedings of the Washington Academy of Sciences, vol. 2, p. 401.

Doane's type (No. 7,051 U. S. N. M., from Unalaska, August 24, 1897) was described three months before Coquillett's *juncta* (No. 5,204 U. S. N. M., Virgin's Bay, Alaska, June 26, 1899) appeared in press.

Cylindrotoma tarsalis Johnson.1912. *Cylindrotoma tarsalis* Johnson; Psyche, vol. 19, p. 2, fig. 4.1912. *Cylindrotoma* (?) *anomala* Johnson; Psyche, vol. 19, pp. 2, 3, fig. 3.

The two names given above represent one and the same species. I have found this insect commonly in various parts of Fulton County, N. Y.

Genus **PHALACROCERA** Schiner.1863. *Phalacrocera* Schiner; Wien. Ent. Monatschr., vol. 7, p. 224.**Phalacrocera neoxena** sp. n.

Wings dark-colored; vein R_1 persistent at the tip as in *replicata* Linnæus.

Male, length, 11.8-12 mm.; wing, 10.4-11 mm.

Female, length, 11.8 mm.; wing, 10.9-11.9 mm.

Rostrum and palpi dark brownish black. Antennæ dark brownish black. Head broad, black with a sparse grayish bloom.

Pronotum black with a gray bloom which is most intense on the sides of the sclerites. Mesonotal præscutum with a pale yellowish gray bloom; four indistinct darker stripes, the median pair long, the lateral pair short and broad; scutum, scutellum and postnotum with a pale grayish white bloom. Pleuræ black with a gray bloom which leaves patches of the ground color at intervals. Halteres long, brown. Legs, coxæ grey, trochanters and femora yellowish brown, brown at the tip, tibiæ light brown, darker brown at the tip, tarsi dark brown. Wings with a brown suffusion; stigma prominent, oval, brown; veins dark brown; venation (Pl. XXV, fig. 10): R_s very long, almost straight; cross-vein r short; R_1 beyond r persistent as in *replicata*, not atrophied as in *tipulina*; cross-vein $r-m$ present as a short vein or else lost by the slight fusion of R_{4+5} on M_{1+2} ; cell 1st M_2 large, arcuated at the base.

Abdominal tergites brown with a dark brownish black median

line; lateral margins of the sclerites narrowly dark brownish black; sternites dark brown. Hypopygial sternites bright yellowish chestnut, tergites brown.

Holotype, ♂, Nipigon, Algona District, Ontario, June 17, 1913 (Dr. E. M. Walker).

Allotype, ♀, topotypic.

Paratype, No. 1, ♂, topotypic; No. 2, ♂, type locality, June 18, 1913; No. 3, ♀, North Fairhaven, Cayuga Co., N. Y., May 17, 1913, found dead in lake drift (Dr. J. G. Needham and Miss Emmeline Moore).

The type and paratype No. 1 is in the collection of the University of Toronto.

This insect is closest to *P. replicata* Linnæus of Europe, but the wings are darker colored, much more tinged with brown; the venation, although similar in the persistence of the tip of R_1 , shows a tendency to the reduction of the radio-median cross-vein, the base of cell 1st M_2 more arcuated and other details. Grünberg's figure of the male hypopygium of *replicata*¹⁹ shows differences in the shape of the 9th tergite and the conspicuous appendages of the 9th sternite. The wing venation of the three known species of the genus are figured on Pl. XXV, *replicata*, fig. 9, *neoxena*, fig. 10, *tipulina*, fig. 11.

At this point it may be mentioned that there is a great difference in the interpretation of the venation of the radial field of the wing in this tribe of craneflies. Most authors have considered the vein R_2 of the *Cylindrotominae* to represent a combined fusion of R_{1+2+3} from the tip of the wing backward. From a study of the venation of the known species of this tribe, about a dozen in all, it is seen that the above interpretation of a long backward fusion of R_{1+2+3} is impossible and two other possible explanations are here presented. Looking over the series of wings before me, it seems that the vein hitherto considered as R_{1+2+3} is, in reality, R_3 or R_{2+3} alone, R_1 becoming atrophied beyond the radial cross-vein rather than obliterating this cross-vein and fusing with R_3 . This is proved by the wings of *Phalacrocera* shown in the plate, in *replicata* and *neoxena*, R_1 being separated from R_{2+3} , whereas in *tipulina* the tip of R_1 is atrophied beyond cross-vein r . A second possible interpretation is that of considering the small cross-vein mentioned by Osten Sacken as occurring in the costal cell beyond the tip of *Sc* and present as a very indistinct vein in many specimens (*Liogma*) as being the

¹⁹ Süßwasserfauna Deutschlands, vol. 2A, pt. 1, p. 33; 1910.

tip of R_1 . In this case R_1 is quite short, extending only a slight distance beyond the fork of the radial sector, and the cross-vein r is very long and simulates a section of vein R , ending at the outer part of the stigma; according to this interpretation, R_1 would be separate, but usually very indistinct or lacking, R_2 is atrophied at its tip except in two species of *Phalacrocera* (*replicata* and *noxena*), whereas the vein hitherto considered as being R_{1+2+3} is really R_3 alone. This latter explanation of these veins of the radial field is probably the correct one.

Subfamily TIPULINÆ.

Tribe Tipulini.

Genus **LONGURIO** Loew.

1869. *Longurio* Loew; Berl. Ent. Zeitschr., vol. 13, p. 3.

Longurio minimus sp. n.]

Size small (wing under 18 mm.); wings with cell M_1 long-petiolate.

Male, length, 21 mm.; wing, 14.6 mm.; abdomen, 17.6 mm.

Female, length, 27 mm.; wing, 16.4 mm.; abdomen, 22 mm.

Frontal prolongation of the head very short, yellowish, the nasus elongate, prominent. Palpi and mouth parts brown. Antennæ short, light yellow, the flagellar segments gradually decreasing in size from the base outward. Eyes rather large, metallic, the front between them narrowed. Head yellowish brown.

Thoracic dorsum brownish yellow, the stripes indistinct in alcoholic material. Pleuræ dull yellow. Halteres yellow, the knob a little darker. Legs, coxæ and trochanters dull light yellow, femora and tibiæ brownish yellow broadly brown at the tip, tarsi brown. Wings with a pale brown suffusion, stigma prominent, a narrow brown seam along the cord; venation (Pl. XXVII, fig. 32): petiole of cell M_1 nearly as long as the cell itself.

Abdominal tergites dull yellow, 7 to 9 dark brown, sternites light yellow, each segment with an elongate brown subterminal median mark, on the 6th and 7th segments covering the caudal end of the segment, 8th sternite dark brown, paler caudally, hypopygium brown.

Holotype, ♂, Tallulah Falls, Rabun Co., Ga., June 17, 1910 (J. C. Bradley).

Allotype, ♀, topotypic.

Paratype, ♂, topotypic.

I am referring this insect to *Longurio*, although it does not agree with *Longurio testaceus* Loew, the genotype, in some respects. L.

*testaceus*²⁰ is a much larger insect (male, wing 25.5 mm., abdomen 36 mm.), the cell *1st M*₂ is much larger and the petiole of cell *M*₁ is very short. *Aeschnosoma rivertonensis* Johnson,²¹ a paratype of which is in my collection through the kindness of Mr. Johnson, is a large fly (male, wing 22 mm., abdomen 30 mm.) with cell *M*₁ entirely sessile.

EXPLANATION OF PLATES XXV, XXVI, XXVII.

PLATE XXV.—Fig. 1.—Wing of *Limnophila subeostata* Alexander.

- Fig. 2.—Wing of *L. (Ephelia) johnsoni* sp. n.
- Fig. 3.—Wing of *L. nigripleura* A. & L. sp. n.
- Fig. 4.—Wing of *L. novae-angliae* sp. n.
- Fig. 5.—Wing of *L. stanwoodae* sp. n.
- Fig. 6.—Wing of *L. osborni* sp. n.
- Fig. 7.—Wing of *Tricyphona katahdin* sp. n.
- Fig. 8.—Wing of *T. vernalis* Osten Sacken.
- Fig. 9.—Wing of *Phalacroecera replicata* Linnæus.
- Fig. 10.—Wing of *P. neoxena* sp. n.
- Fig. 11.—Wing of *P. tipulina* Osten Sacken.

PLATE XXVI.—Fig. 12.—Wing of *Erioptera (Mesocyphona) rubia* sp. n.

- Fig. 13.—Wing of *E. (Erioptera) dorothea* sp. n.
- Fig. 14.—Wing of *E. (Erioptera) microcellula* sp. n.
- Fig. 15.—Wing of *E. (Empeda) alicia* sp. n.
- Fig. 16.—Hypopygium of *E. (E.) microcellula*; dorsal aspect of the pleurite and appendages. *d* = dorsal appendage.
- Fig. 17.—Hypopygium of *E. (E.) microcellula*; ventral aspect of the dorsal apical appendage.
- Fig. 18.—Hypopygium of *E. (E.) microcellula*; ventral aspect of the ventral gonapophyses.
- Fig. 19.—Hypopygium of *E. (E.) lucia*; lateral aspect of the pleurite.
- Fig. 20.—Hypopygium of *E. (E.) lucia*; dorsal aspect of the pleurite.
- Fig. 21.—Hypopygium of *Gonomyia (Leiponeura) saeandaga*; dorsal aspect.

PLATE XXVII.—Fig. 22.—Wing of *Dieranomyia nelliana* sp. n.

- Fig. 23.—Wing of *Rhipidia (Arhipidia) shannoni* sp. n.
- Fig. 24.—Wing of *Teucholabis rubescens* sp. n.
- Fig. 25.—Wing of *Gonomyia (Leiponeura) saeandaga* sp. n.
- Fig. 26.—Wing of ? *Gonomyia slossonae* sp. n.
- Fig. 27.—Wing of *Cladura delicatula* sp. n.
- Fig. 28.—Wing of *Limnophila cmmelina* sp. n.,
- Fig. 29.—Wing of *L. (Dactylolabis) hortensia* sp. n.
- Fig. 30.—Wing of *Rhaphidolabis polymeroides* sp. n.
- Fig. 31.—Wing of *Dieranota pallida* sp. n.
- Fig. 32.—Wing of *Longurio minimus* sp. n.

²⁰ Berlin. *Entomol. Zeitschr.*, vol. 13, p. 3; 1869.

²¹ *Proceedings of the Boston Society of Natural History*, vol. 34, p. 116, pl. 16, figs. 13-15; 1909.